A HIGHLY RESISTANT THERMOPHILIC ORGANISM

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An examination of spoilage samples of "Standard Maine Style" corn which had been packed in the usual manner and processed at 118°C. for 75 minutes showed the presence of a thermophile. The same organism was later found in spoiled cans of string beans and corn on the cob. It appears to be an unknown species and the name *Bacillus stearothermophilus* is proposed for it.

Its cultural characteristics are as follows:

Name proposed: B. stearothermophilus. (N. S.)

Source: Canned corn.

Date of isolation: October 3, 1917.

Vegetative cells: Medium used, agar; temperature, 60 to 65°C; age, twenty-four hours; form, large rods; arrangement, majority single, some in pairs end to end and few in chains of three or four. Size of majority 0.8 by 3.5 micra; ends rounded.

Relation to oxygen: Aerobic, facultative anaerobic.

Endospores: Present; location, polar. Size of majority 1 by 1.5 micra.

Motility: None.

Flagella: None. Muir's modification of Pittfield's method, and Loeffler's method.

Gram stain: Negative.

Nutrient broth: Surface growth, none; no pellicle or ring; clouding of medium uniform, odor, absent; sediment, compact, abundant.

Agar stroke: Growth, moderate; form of growth, generally filiform, sometimes slightly beaded, never spreading; elevation of growth, quite regular; optical character, translucent; chromogenesis, none; color, dirty white; odor, absent; consistency, butyrous.

Agar colonies: Growth moderate; temperature 60° to 65°C. form, circular; surface, smooth; elevation, flat; edge, regular; maximum diameter observed 2 mm., white opaque spot in center surrounded by several concentric rings.

Gelatin: Temperature 20°C., no growth; 60° to 65°C. growth but no liquefaction. (Inoculated tube showed uniform clouding after incubation for three days, solidified when placed in ice-box.)

Glucose agar stroke and stab (litmus): Growth, acid throughout.

Lactose agar stroke and stab (litmus): Growth, acid throughout.

Sucrose agar stroke and stab (litmus): Growth, acid throughout.

Potato: Growth, none.

Potato starch agar: Growth copious.

Corn infusion (litmus): Strong acid after twenty-four hours. Starch digested.

Temperature relations: Optimum temperature for growth 50°C. Maximum 76°C. Minimum 45°C.

Litmus milk: Growth begins after twenty-four hours, acidified, litmus partly reduced. No coagulation after forty-eight hours. After four days litmus completely reduced and casein digested, leaving heavy sediment in bottom of tube. (Control tube showed loss of color only after six days, no coagulation, no digestion.)

Indol production: Absent.

Nitrate broth: Not reduced; ammonia, none.

Glucose broth: Gas production, none.

Lactose broth: Gas production, none.

Sucrose broth: Gas production, none.

The thermal death relations at two temperatures and in media containing different numbers of spores are as follows:

MEDIUM	pH VALUE	TEMPERATURE	SPORES PER CUBIC CENTIMETER	TIME TO KILL
		°C.		
Corn broth.....	6.1	100	12,500	17 hours
Corn broth.....	6.0	120	50,000	11 minutes